The relationship between body condition score and cow well-being

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Welfare and well-being



'Let us not mince words. Animal welfare involves the subjective feelings of animals' (Marian Dawkins, 1990)

- One of the fundamental aims of animal welfare science is to try to understand the psychological experience of the individual animal
- By 'emotional experience' (or subjective feelings) we mean states like pain, stress, fear or happiness
- Much research in animal welfare science looks for what aspects of housing, husbandry etc. cause negative states, and then works out how to 'fix' the problem to achieve better welfare

BCS and emotional experience



 An action that promotes positive feelings is likely to be repeated while actions that promote negative feelings are likely to be avoided

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• So emotions motivate future behaviour



- Question: how is body condition related to emotional states that motivate behaviour
- OR that lead to conditions associated with poor welfare
- May be direct or indirect

Association between BCS and emotional experience



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- 1. L:ow/high BCS associated with physiological states
- 2. Physiological/disease states associated with emotional states

Associations between BCS and health



- Indirect impacts of BCS on disease and dystocia:
 - There are associations between BCS and lameness, uterine infections and periparturient metabolic disease (e.g. review from Roche et al., 2009)
 - Widely accepted that high BCS associated with dystocia and also with still birth (Chassenge et al., 1999)
 - High BCS associated with higher levels of leg lesions (Mülleder and Waiblinger, 2004)



Associations between health and emotional state



• Expert opinion suggests that dystocia is a painful experience (Huxley and Whay, 2006)

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• Lameness also considered to be painful (Whay et al., 1998)



Association between BCS and emotional experience



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Need to look for evidence that:

- 1. Hunger/disease/dystocia associated with emotional states
- 2. That low/high BCS associated with hunger/disease/dystocia

Hunger



- Hunger can be defined as a 'negative subjective state experienced by an animal that is chronically undernourished' (D'Eath et al., 2009)
- What is the evidence that cattle suffer from hunger (or show feeding motivation)?
- Will they 'pay a cost' to gain access to feed?



Assessing hunger in dairy cows

- Study by Schütz et al (2006)
- Asked cows to walk increasing distances (laps of the structure shown) to gain access to feed
- Effect of short term deprivation of 0, 3, 6, 9 hours: linear increase in distance walked with increasing deprivation in lactating cows
- No effect of BCS on distance walked
- 10-point scale used: mean BCS 4.4–
 4.8 across groups with little variation



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Assessing hunger in cows

- Similar studies of hunger have used a weighted push door to assess feeding motivation
- Heifers fed a restricted level of TMR pushed more weight than heifers fed ad libitum (Greter et al 2015)
- Cows on a reduced energy diet prior to drying off pushed 5x more weight than cows on normal lactation diet (Franchi et al. 2019)
- Did not test effects of BCS



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Screenshot from Franchi et al 2019

Hunger and BCS in sheep

- Sheep of BCS 2 and 3 tested (1-5 scale)
- Sheep offered a food reward and once they started eating, an automatic gate would move them 7m away from it
- Tested 3 groups: stable (maintained at score 3), fast-decline (loss of 1 unit over 4– 6 weeks) and slow decline (loss of 1 unit over 10–12 weeks)
- Sheep with slow declining BCS were more agitated and anxious when separated from the feed





Association between BCS and emotional experience



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Need to look for evidence that:

- 1. Hunger/disease/dystocia associated with emotional states
- 2. That low/high BCS associated with hunger/disease/dystocia

Conclusions



- Good evidence that BCS extremes are associated with disease and dystocia
- Good evidence that disease and dystocia cause negative emotional states such as pain and distress
- Good evidence that hunger is a negative state that animals will work to avoid
- No hard evidence that low BCS is associated with hunger and therefore with anxiety
 - However, it does not seem that the research has been done to answer this question



Conclusions



- However, there is enough evidence to conclude that body condition status contributes to cow well-being
- Body condition scoring is a useful indicator of welfare
- In terms of how to score BCS, this is little direct evidence to indicate what sort of scoring system would best represent wellbeing
- However, it appears that any scoring system must be designed to capture the 'too thin' and the 'too fat' cow, and likely the change in BCS, as these states appear to affect well-being the most

